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To: Members of the Executive Board

From: The Secretary

Subject: **A Methodology for Exchange Rate Assessments and its Application
in Fund Surveillance over Major Industrial Countries**

Attached for consideration by the Executive Directors is a paper on a methodology for exchange rate assessments and its application in Fund surveillance over major industrial countries, which is tentatively scheduled for discussion on Monday, October 27, 1997. Concluding remarks and issues for discussion appear on pages 45–47.

Mr. Isard (ext. 36640) or Mr. Nord (ext. 37324) is available to answer technical or factual questions relating to this paper prior to the Board discussion.

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INTERNATIONAL MONETARY FUND

**A Methodology for Exchange Rate Assessments and its
Application in Fund Surveillance over Major Industrial Countries**

Prepared by the Research Department and the
Policy Development and Review Department

(In consultation with other departments)

Approved by Michael Mussa and Jack Boorman

October 3, 1997

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EXECUTIVE SUMMARY

The oversight over the exchange rate policies of members remains at the core of the Fund's surveillance mandate. The recently-concluded Biennial Review of Surveillance emphasized that the effectiveness of Fund surveillance depended on frank discussion of exchange rate issues between the authorities and the staff, and on the Board being fully informed of these discussions.

The Fund has generally avoided public pronouncements on exchange rate constellations. However, in recent years, the staff has strengthened its analytical work on exchange rate issues, building on a long tradition within the Fund, to improve its ability to identify possible misalignments among major currencies. An inter-departmental working group, the *Coordinating Group on Exchange Rate Issues (CGER)*, has been established to act as the technical secretariat to prepare exchange rate analysis for staff and management discussion.

The primary motivation for the exchange rate assessment exercises is to look for cases of badly misaligned exchange rates ("wrong rates"), not to prescribe exchange rate targets or target zones. CGER's estimates of "equilibrium" exchange rates cannot be placed within narrow confidence bands. Whether anything should be done when the methodology identifies possible misalignments among the major currencies is left as a question to be addressed on a case by case basis and in the context of considering the extent to which monetary and fiscal policies are appropriate from a broader perspective.

The methodology represents a refinement and extension of the macroeconomic balance approach that the staff has been relying upon for at least the past three decades. The formal analysis focuses on the extent to which prevailing market exchange rates and the implied current account positions are consistent with medium-run fundamentals. This provides a starting point for a more judgmental assessment of the appropriateness of prevailing exchange rates in the context of a broader range of considerations, including the cyclical positions of national economies. Applications over the past several years have focused mainly on the exchange rates of the major industrial countries. Staff work is continuing on strengthening the methodology and making it applicable to additional countries.

The methodology contains four steps. The first step involves the application of a trade-equation model to calculate the underlying current account positions that would emerge at prevailing market exchange rates if all countries were producing at their potential output levels. The second step uses a separate model to estimate a normal or equilibrium level of the saving-investment balance that would be consistent with medium-run fundamentals, including the assumption that countries were operating at potential output. The third step, which reflects the national income accounting identity between the current account (net exports) and the saving-investment balance, calculates the amount that the exchange rate would have to change, other things equal, to equilibrate the underlying current account position with the

medium-run saving-investment norm. The fourth step involves judgmental assessments of whether the estimates of exchange rates consistent with medium-run fundamentals suggest that any currencies are badly misaligned.

Retrospective applications of the CGER methodology to episodes that are widely regarded as extreme misalignments of major currencies in the 1980s and 1990s would have delivered correct signals at the time. Since late 1994, Fund surveillance of the major industrial countries has been informed by the CGER framework, which pointed to a substantial misalignment among G-3 currencies in the spring of 1995 and also entered into the staff's assessments of the Italian lira in 1995-96, when Italy's ERM re-entry was under discussion. The sharp movement in major currencies in the first half of 1997, seen in the context of large divergences in the cyclical positions of the major industrial countries, has been regarded as generally helpful.

I. INTRODUCTION

1. The oversight over exchange rate policies of members was a key concern of the drafters of the Second Amendment and remains at the core of the Fund's surveillance mandate. The recently-concluded Biennial Review of Surveillance emphasized that the effectiveness of Fund surveillance depended on frank discussion of exchange rate issues between the authorities and the staff, and on the Board being fully informed of these discussions.¹ The resulting Staff Operational Guidance Note encouraged staff reports to include a candid assessment of a member's exchange rate and exchange rate policy.²

2. During a discussion in 1994, Directors generally agreed that the Fund in its surveillance role needed to monitor closely and assess carefully actual or emerging exchange rate misalignments.³ They emphasized the considerable difficulties in estimating equilibrium exchange rates and indicated that Fund views on possible misalignments should be communicated in a timely and confidential manner to the authorities concerned. At the same time, most Directors were opposed to the Fund taking a more public posture on exchange rate misalignments.

3. Against this background, in late 1994 the staff began to provide the Surveillance Committee⁴ with more extensive and systematic assessments of the exchange rates of the major industrial countries, incorporating both the perspectives of the staff's country teams and the views suggested by a multilateral analytic framework implemented by the Research Department. Subsequently, in the spring of 1995, an interdepartmental working group, the *Coordinating Group on Exchange Rate Issues (CGER)*, was established to act as a technical secretariat to the *Surveillance Committee* on these issues. Since its inception, the CGER has focused primarily on developing a methodology for assessing the appropriateness of current

¹*Summing Up by the Chairman — Biennial Review of the Implementation of the Fund's Surveillance over Members' Exchange Rate Policies and of the 1977 Surveillance Decision* (SUR/97/38, 4/3/97).

²*Staff Operational Guidance Note Following the 1997 Biennial Surveillance Review* (SM/97/178, 7/3/97).

³*Summing Up By the Chairman.— Future Orientation of the Fund – Making Multilateral Surveillance More Effective, and Observations and Issues Concerning International Policy Coordination* (SUR/94/115, 9/22/94).

⁴The *Surveillance Committee* comprises Fund management and the directors of selected departments. It meets regularly to discuss major surveillance policy issues, to consider and clear drafts of briefing papers and staff reports for selected countries, and to discuss drafts of other surveillance papers.

account positions and exchange rates, beginning with those of the major industrial countries. At the same time, area department staff have drawn on the CGER framework to appraise exchange rates in a number of other cases, and CGER has been working to extend its analysis to a broader group of countries.⁵ The work has served to reinforce the staff's analysis of members' economic policies. While the assessments have, at times, been discussed with the concerned country representatives in keeping with the guidance of the Board, the work has not aimed at making public statements.

4. The CGER framework should be seen as a *starting point* that provides a systematic, globally consistent, and transparent initial assessment of exchange rates. There are alternative views about how such assessments should be done and what they mean; see Box 1. Some economists, both among the Fund staff and within the economics profession more generally, question whether exchange rates can ever become substantially misaligned with economic fundamentals. While it is recognized that macroeconomic policies may sometimes become unsustainable or otherwise undesirable, and that unsound macroeconomic policies can drive exchange rates to undesirable levels, this does not necessarily imply, as a logical proposition, that market exchange rates ever become strongly inconsistent with fundamentals when economic policies are taken into account. A second group accepts the view that exchange rates can become substantially misaligned in concept but questions whether a single econometric model can adequately quantify such misalignments in practice.

5. CGER's analysis is based on the view that some market exchange rates have at times become badly misaligned with fundamentals, and that a quantitative framework is important for trying to identify misalignments at an early stage. However, the initial assessments derived from CGER's quantitative framework are re-evaluated and sometimes modified by bringing other information and judgments to bear. CGER thus provides the Surveillance Committee with *inputs* for periodic assessments of the prevailing configuration of current account positions and exchange rates among the major currencies. These complement, rather than substitute for, the various measures of international competitiveness and financial market conditions that

⁵Since the CGER methodology assumes countries have access to international capital markets, the framework is not applicable to cases in which access to these markets is significantly curtailed. The staff's analysis of exchange rate issues for developing countries has focused heavily in recent years on responses to capital inflows and early warning indicators. In addition, the staff is currently addressing (a) the problems that can arise in fixed exchange rate regimes and the related issue of exit strategy, and (b) the identification of circumstances that call for different types of exchange rate systems. A paper under preparation on the former issue could provide the basis for an Executive Board seminar in the months ahead. With regard to the estimation of equilibrium exchange rates for developing countries, Hinkle and Montiel (1997), in a project sponsored by the World Bank, present analyses based on several different approaches.

Box 1. Alternative Views on Evaluating Exchange Rates

There are alternative views on the usefulness of evaluating exchange rate “misalignment.” One view would be that exchange rates, in their role of clearing foreign exchange markets, must reflect economic fundamentals. From this perspective, there is little value in second-guessing the market’s assessment with econometric models: the exchange rate, while possibly not at an equilibrium for the medium to long run, is appropriate in the current policy environment.

A second view accepts the concept of exchange rate misalignment while remaining skeptical about the ability of a single model to adequately quantify misalignments in practice.

A third view maintains that quantitative assessments of exchange rates are useful while also emphasizing that deviations of exchange rates from medium-run equilibrium levels are not always a source of concern. In this view, the key question is the appropriateness of economic policies: an “apparent misalignment” can be either consistent or inconsistent with prevailing policies, and does not say anything about whether the policies are desirable.

To illustrate the third view, consider a situation in which country A’s real effective exchange rate is substantially depreciated relative to an estimate of its medium-run equilibrium level. Possible interpretations include:

- **The prevailing exchange rate is appropriate, even though it differs from its medium-run equilibrium level.** This might be the case, for example, if economic activity in country A is weak, with the depreciated exchange rate providing helpful stimulus, and if interest rates in country A are relatively low as a reflection of countercyclical monetary policy. In such a situation, international interest rate differentials might be interpreted as suggesting that country A’s currency is expected to appreciate over time toward the level consistent with medium-run fundamentals.
- **The prevailing exchange rate is appropriate given policies, but policies are inappropriate.** This might be the most relevant interpretation for cases in which fiscal deficits are excessive. Support for this interpretation would be strengthened if international interest rate differentials are also large, and if market commentary suggests that the interest differentials could be interpreted as reflecting concerns about fiscal deficits.
- **The prevailing exchange rate is inappropriate given policies, but policy adjustment would be appropriate.** This might be the most relevant interpretation if economic activity in country A is relatively strong, with the depreciated exchange rate providing unhelpful stimulus, and if overheating concerns provide a case for raising interest rates, which not only would cool the economy but also would tend to appreciate the exchange rate.
- **The prevailing exchange rate is inappropriate given policies, and policy adjustment would be inappropriate.** Such circumstances raise the question of whether policy authorities should make an effort to influence market perceptions.

have traditionally played a major role in the Fund's surveillance over members' exchange rates and exchange rate policies.

6. The CGER assessment process cannot deliver precise estimates of the medium-run equilibrium levels of real exchange rates. Indeed, for market determined exchange rates, the notion that there are precise values for equilibrium real exchange rates is probably bogus. The objective of the assessment process is to identify circumstances in which the market-determined exchange rates of some of the major currencies have moved outside "reasonable ranges" that should be considered as broadly consistent with economic fundamentals—to identify *possible situations of serious misalignment* of major currency exchange rates.⁶ The analysis recognizes that situations in which prevailing exchange rates appear to deviate substantially from their medium-run equilibrium values do not always represent serious misalignments. In some cases, market participants may expect exchange rates to move over time toward their medium-run equilibrium levels, such that the initial substantial deviations between prevailing rates and their medium-run equilibrium levels would be largely eliminated. These anticipated adjustments would normally be reflected in interest rate differentials and forward exchange rates. In certain situations, of course, large interest rate differentials may indicate a need for policy adjustment—for example, when they reflect market concerns about fiscal imbalances—but such situations should not be regarded as serious misalignments when countries' macroeconomic policies are fundamentally sound. However, in other cases, substantial deviations of prevailing exchange rates from their medium-run equilibrium values may be identified against a background of sound policies and relatively narrow interest differentials, suggesting that exchange rates may have become misaligned.

7. Because there is no general answer to the question of whether actions should be taken when exchange rates appear to deviate substantially from their medium-run equilibrium values, the staff's analysis leaves this question entirely open—to be addressed on a case-by-case basis in the context of a broader assessment of macroeconomic circumstances. Whether anything should be said, publicly, when such a situation is identified is also left as an open question.

8. Much of the conceptual framework presented here represents refinements and extensions of an approach that the Fund staff has found useful for several decades now in its surveillance over exchange rate policies, and this approach continues to evolve.⁷ Section II

⁶These "reasonable ranges" must not be confused with the concept of "target zones." Specification of "target zones" for major currency exchange rates implies a serious commitment to adjust economic policies to hold exchange rates within these zones. Except for the European currencies in the ERM, there is no such policy commitment for the major industrial countries.

⁷For published versions of papers originally prepared for previous Executive Board

(continued...)

provides background on the case for exchange rate assessment, on alternative methodologies, and on the history of exchange rate assessment within the Fund. Section III motivates and describes the key features of the CGER approach. Section IV discusses the limitations of the analytical framework and also evaluates how well retrospective assessments based on this methodology would have performed in the past. Section V presents an overview of recent applications of current account and exchange rate assessments in the context of Fund surveillance. Concluding remarks and issues for discussion are provided in Section VI.

II. BACKGROUND

9. For at least three decades, the staff of the International Monetary Fund has been engaged in efforts to develop and sharpen “tools to enable it to get a clearer view of what exchange rates were or were not reasonably close to equilibrium levels, and how large a change might be appropriate for rates that it believed to be . . . ‘misaligned’.”⁸ Such analysis has been viewed as an integral part of the Fund’s responsibility for exercising “firm surveillance over the exchange rate policies of members . . .” (Article IV, Section 3(b)).

10. In assessing the appropriateness of exchange rates, the staff has employed a variety of analytic frameworks. One approach has been to look at simple calculations of purchasing power parity or international competitiveness. An additional approach that has been prominent in the Fund since at least as far back as the summer of 1967, when views were being developed about the appropriate size of the prospective devaluation of sterling, has featured quantitative assessments of the exchange rates consistent with “desirable” current account positions.⁹ Although it was not until 1973 that the staff first published in detail its Multilateral Exchange Rate Model (MERM),¹⁰ which provided consistent estimates of the trade effects of simultaneous changes in the exchange rates for the currencies of all industrial countries, an earlier version of MERM had become available in 1970 and provided a framework for analysis by the staff during the period preceding the Smithsonian conference in December 1971.¹¹

⁷(...continued)

discussions of exchange rate assessment methodologies, see Artus and Knight (1984) and Clark and others (1994).

⁸Polak (1995), p. 740.

⁹Polak (1995), pp. 742-3.

¹⁰Artus and Rhomberg (1973).

¹¹Polak (1995), p. 745. The earlier version was based on the work of Paul Armington and

(continued...)

11. The shift in the early 1970s to a system of floating exchange rates among many of the major currencies diminished the most obvious need for models that could be used to calculate appropriate par values. A second factor that acted to discourage further development of such models during the 1970s was a fairly common (though by no means universal) belief in the efficiency of foreign exchange markets. Such a belief posed a challenge to the suggestion that econometric models could be superior to markets in providing assessments of appropriate exchange rates.¹²

12. By the mid-1980s, experience under the floating rate system had called into question the notion that freely functioning markets would always keep exchange rates closely aligned with their "equilibrium" values. As indicated by Chart 1, which shows nominal and real effective exchange rates for the major industrial countries since the inception of the system of generalized floating, currency values have exhibited wide fluctuations.¹³ Indeed, for the yen between early 1976 and early 1980; for the pound sterling between mid-1978 and the early 1980s, and for the U.S. dollar between the end of 1980 and early 1987, real effective exchange rates moved over ranges as wide as 40 to 60 percent. More recently, over the past five years the yen has risen and fallen by more than 30 percent in real effective terms, while the pound has weakened and strengthened by about 20 percent. By contrast, the continental European countries have experienced more moderate fluctuations in their trade-weighted

¹¹(...continued)
Rudolf Rhomberg.

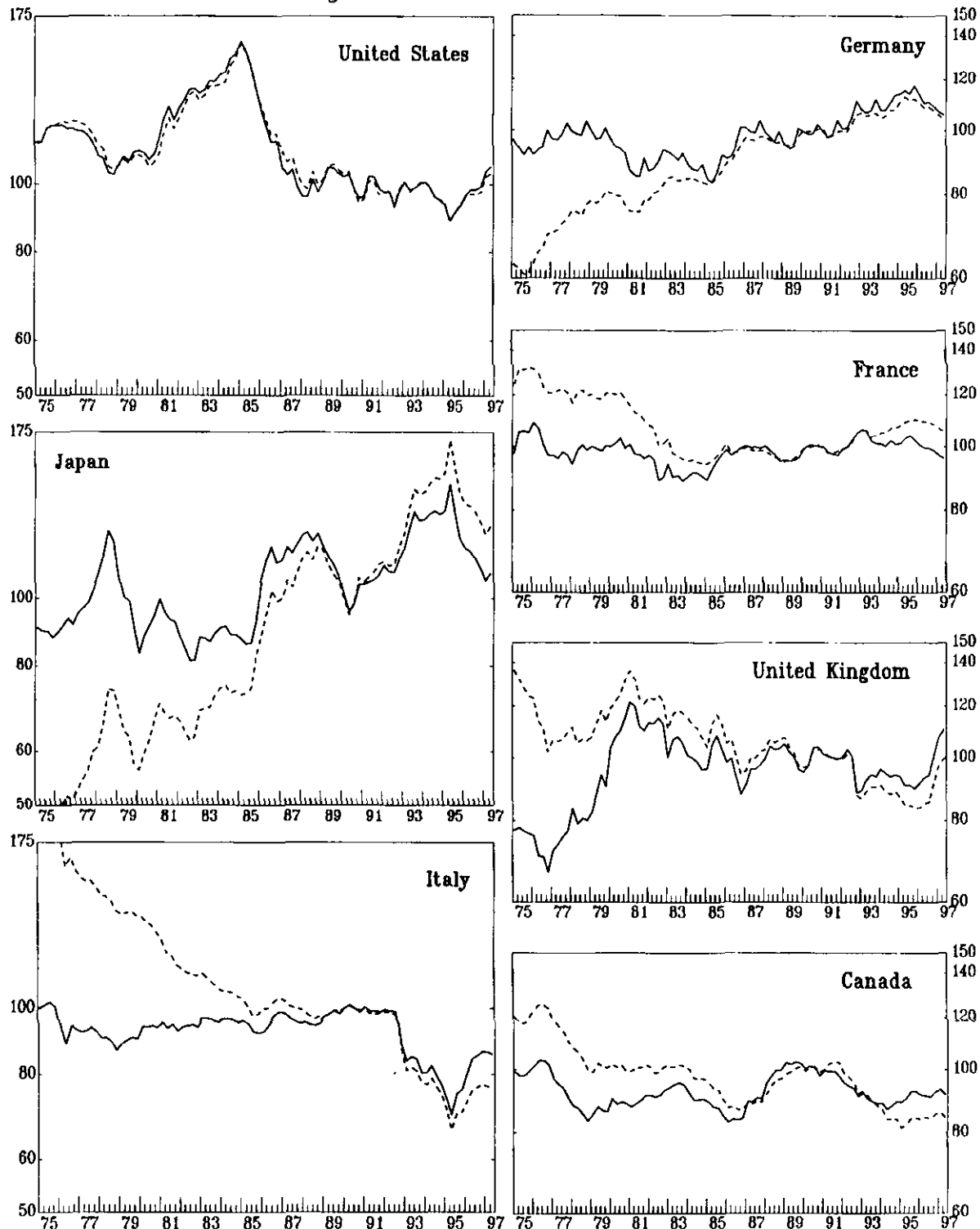
¹²Among policymakers, however, there remained significant concerns that floating exchange rates could be driven to inappropriate levels, and in the context of such concerns, discussions of the Fund's surveillance procedures emphasized that countries with pegged and floating exchange rates should be treated evenhandedly. Consistently, the Second Amendment to the Fund's Articles of Agreement (adopted by the Board of Governors in April 1976 and effective two years later) stressed that members should "avoid manipulating exchange rates" and, in the view of Polak (1995, p. 747), "conveyed, in much stronger terms than the par value regime had ever done, the notion that members should avoid serious deviations of their exchange rates from an equilibrium rate...."

¹³Each country's real exchange rate is constructed by calculating a trade-weighted average of foreign GDP deflators (price levels) converted at nominal exchange rates into the domestic currency unit, and then dividing by the country's own GDP deflator. The calculations are based on trade weights from the Fund's Information Notice System, which take into account competition between imports and locally-produced import-substituting goods, competition between own exports and locally-produced foreign goods, and competition between own exports and exports of other countries in third markets; see Zanello and Desruelle (1997) and McGuirk (1987).

Chart 1. Major Industrial Countries: Nominal and Real Effective Exchange Rates^{1/}

(Indices, 1990=100; logarithmic scale)

— Real Effective Exchange Rate
-- Nominal Effective Exchange Rate



^{1/} Real effective exchange rates are based on GDP deflators. For the last four quarters, data on GDP deflators represent staff estimates interpolated from the annual data and projections in the World Economic Outlook database.

effective exchange rates, reflecting both the relatively large share of intra-European trade in their total imports and exports and the relatively stable nominal exchange rates that have been maintained between European currencies. However, bilateral real and nominal exchange rates of the major continental European currencies against the U.S. dollar and the Japanese yen have sometimes fluctuated widely.

13. Economists have not been very successful in their attempts to explain the *short-run* behavior of exchange rates econometrically in terms of macroeconomic fundamentals.¹⁴ Partial explanations have been agreed upon for some of the wide swings in major currency exchange rates, such as the impact of the shift in the U.S. policy mix in pushing the dollar higher in 1980-82. However, substantial parts of most of the wide swings of major currency exchange rates do not have convincing and generally accepted explanations in terms of movements in economic fundamentals.¹⁵

14. In this situation, it is not surprising that policymakers and other analysts have from time to time developed a broad consensus that certain exchange rates had become badly misaligned with fundamentals. Such views have typically been based on perceptions that exchange rates had moved to levels at which countries could not sustain their international competitiveness over the *longer run*, or at which countries would be projected to develop large macroeconomic imbalances. In this context, CGER's work may be seen as an effort to provide a firmer analytical foundation for judgments of situations where major currency

¹⁴For perspectives on empirical attempts to explain the short-run behavior of exchange rates, see Meese and Rogoff (1983a, 1983b, 1988), MacDonald and Taylor (1992), Frankel and Rose (1995). See also MacDonald (1997) for somewhat more encouraging recent results.

¹⁵Surveys of institutional investors (e.g., Taylor and Allen (1992), Group of Ten Deputies (1993)), have found that market participants, in "driving" exchange rates up or down, base their currency positions to a significant extent on charts or other forms of "technical analysis" of very recent trends or other patterns in the observed behavior of exchange rates, rather than basing their trading entirely on analysis of macroeconomic fundamentals. Similar characteristics are found in markets for equities and other financial assets; see Shleifer and Summers (1990). Whether reliance on technical analysis represents irrational behavior is a matter of debate. A literature is emerging that tries to rationalize such behavior in an environment of limited information about macroeconomic fundamentals; see Genotte and Leland (1990), De Long et al. (1990a, b), Banerjee (1992), Romer (1993). Related to this, it is evident from survey data that market participants have heterogeneous exchange rate expectations; see Ito (1990), Bryant (1995). It has also been found in simulation experiments that various types of trading strategies based on technical analysis generate statistically significant profits; see Dooley and Shafer (1983), Sweeney (1986), Cumby and Modest (1987).

exchange rates may be significantly misaligned. CGER's analysis is based on the premise that estimates of the "equilibrium" exchange rate levels that would be consistent with maintaining macroeconomic balance and international competitiveness from a medium-run perspective can be useful in helping to judge—along with other evidence and considerations—whether market exchange rates have become badly misaligned in the short run.

15. As already mentioned, one approach to defining equilibrium exchange rates from a medium-run perspective is to rely on calculations of purchasing power parity (PPP) or international competitiveness ratios. Such calculations generally employ aggregate price or cost indices (such as indices of consumer prices, GDP deflators, export prices, or unit labor costs); their conceptual appeal comes primarily from the notion that the prices of (or the costs of producing) similar goods, when translated into a common currency unit, should be similar across countries—that is, should conform to the so-called "law of one price"—at least in the case of tradable goods. As propositions about short-run behavior, both the "law of one price" for individual narrowly-defined categories of tradable goods, and PPP for the aggregate outputs of countries, are strongly rejected by the data. From a longer-term perspective, however, these propositions appear to have more empirical support, particularly when the PPP hypothesis is modified to allow for divergent trends in the prices of tradable and nontradable goods and services;¹⁶ and empirical testing of the long-run PPP hypothesis has undergone a remarkable rejuvenation in recent years.¹⁷

16. In its previous discussions of exchange rate assessment methodologies, the Executive Board has noted that indices of international price and cost competitiveness provide only limited guidance in attempting to gauge the "equilibrium" level of exchange rates over the medium run.¹⁸ For one thing, because calculations of international competitiveness ratios are

¹⁶Quantitative comparisons of living standards in different countries have observed that prices of nontradable goods and services, relative to prices of tradables, tend to be higher in high-income countries than in low-income countries; see, for example, Gilbert and Kravis (1954), Kravis, Heston, and Summers (1982), Summers and Heston (1991). Balassa (1964) and Samuelson (1964) hypothesized that this empirical regularity reflected a tendency for productivity in the tradable goods sector to rise relative to productivity in the nontradables sector as real incomes expanded. Isard and Symansky (1996) provide a summary of econometric tests of the Balassa-Samuelson hypothesis, which have been conducted mainly with data for OECD countries, along with some empirical perspectives for the APEC region.

¹⁷Recent reviews of the literature are provided by Breuer (1994), Isard (1995), MacDonald (1995), Froot and Rogoff (1996), Rogoff (1996).

¹⁸See also Artus and Knight (1984) and Clark and others (1994). In some cases, reliance on PPP for policy prescription has led to major difficulties, as in the case of Great Britain's return
(continued...)

typically based on price or cost *indices*, rather than data on the absolute levels of prices or costs, a country's international competitiveness at prevailing exchange rates typically can only be assessed via comparison with its (average) international competitiveness ratio during some representative or normal base period; thus, such comparisons can be sensitive to the choice of base period. Second, assessments of international competitiveness can be sensitive to the type of price or cost indices on which they are based; for example, assessments based on GDP deflators can sometimes be quite different than assessments based on consumer prices, wholesale prices, export prices, or unit labor costs.¹⁹ Third, the theoretical assumptions that underlie the notion of a stable "equilibrium" level of international price or cost competitiveness can be challenged.²⁰ Nevertheless, the staff has found that calculations of different types of measures of international price and cost competitiveness can often be useful in judging the plausibility of other types of estimates of "equilibrium" exchange rates.

17. A second approach to defining equilibrium exchange rates from a medium-run perspective has become known as the macroeconomic balance approach. This approach, which focuses on the requirements for achieving internal and external balance simultaneously, has been traced at least as far back as Nurkse (1945) and Metzler (1951), with pathbreaking contributions from Meade (1951) and Swan (1963). As refined by the Fund staff during the 1970s,²¹ and also used by Williamson and others in their early work on "fundamental

¹⁸(...continued)

to the gold standard in April 1925, which was based on calculations showing that a return to the prewar gold parity would approximately restore sterling's PPP against the U.S. dollar, and which turned out to have disastrous consequences for the British economy; see Moggridge (1972), Kindleberger (1984).

¹⁹See Lipschitz and McDonald (1992), Turner and Van 't dack (1993), and Marsh and Tokarick (1994) for perspectives on different competitiveness indicators.

²⁰In particular, the assumption that relative national price or cost levels (as measured by aggregate price or cost indices) should remain constant over time, at least for tradable goods, is called into question by several considerations: (i) the composition of tradable goods across countries can change over time; (ii) changes over time in the relative prices of different tradables can contribute to deviations from PPP insofar as the weights of different categories of tradable goods in national price or cost indices differ across countries; and (iii) the scope for "arbitraging" price or cost differentials across countries can be affected by the liberalization of trade and foreign exchange restrictions, reductions in transportation costs, or changes in other components of the costs of market penetration. See Isard and Symansky (1996).

²¹Artus (1978), Artus and Knight (1984), Polak (1995).

equilibrium exchange rates" (FEERs),²² the macroeconomic balance approach is rooted in the balance of payments identity—namely, the equality between the current account balance (CUR) and the net inflow of private and official capital (CAP),

$$(1) \text{ CUR} = \text{CAP}.$$

18. The current account balance is explicitly recognized to depend on the real exchange rate, which affects the volumes and values of imports and exports—with the complicating feature that the effects of changes in the exchange rate on CUR usually take some time to materialize fully. CUR also depends on levels of domestic and foreign incomes (or in some formulations on domestic and foreign output gaps) and on a variety of other factors that may shift the current account balance over time.

19. Early applications of the macroeconomic balance approach tended to treat CAP as the "normal" or "target" or "underlying" level of net capital inflows. The "equilibrium" level of the exchange rate in this approach was the constant level of the exchange rate that would equate CUR to this "normal" level of CAP, with other factors affecting the CUR usually assumed to be at their respective "normal" levels (e.g., domestic and foreign incomes were usually assumed to be at full employment).

20. More recent applications of the macroeconomic balance framework have given greater emphasis to the national income accounting identity that links the current account position to the excess of domestic saving (S) over domestic investment (I),²³

$$(2) \text{ CUR} = S - I.$$

21. While the two identities are closely related, the shift in emphasis has been in the direction of relying less on relatively ad hoc judgments about equilibrium capital flows and more on models of the equilibrium saving-investment balance,²⁴ with emphasis on modeling

²²Williamson (1985, 1994).

²³Specifically, saving (S) minus investment (I) equals output (Y) minus absorption (where absorption is the sum of private consumption (C), government consumption (G), and investment), which also equals exports (X) minus imports (M), corresponding to the national income concept of the current account (CUR). When applying the macroeconomic balance approach, definitional distinctions between different concepts of the current account must be taken into account, especially with respect to the treatment of payments and receipts for factor services and transfers.

²⁴See, for example, Knight and Masson (1988) and Williamson (ed., 1994).

the saving-investment balance in terms of its medium- or long-run determinants. This will be clarified below in the context of describing CGER's methodology.²⁵

III. METHODOLOGICAL FRAMEWORK

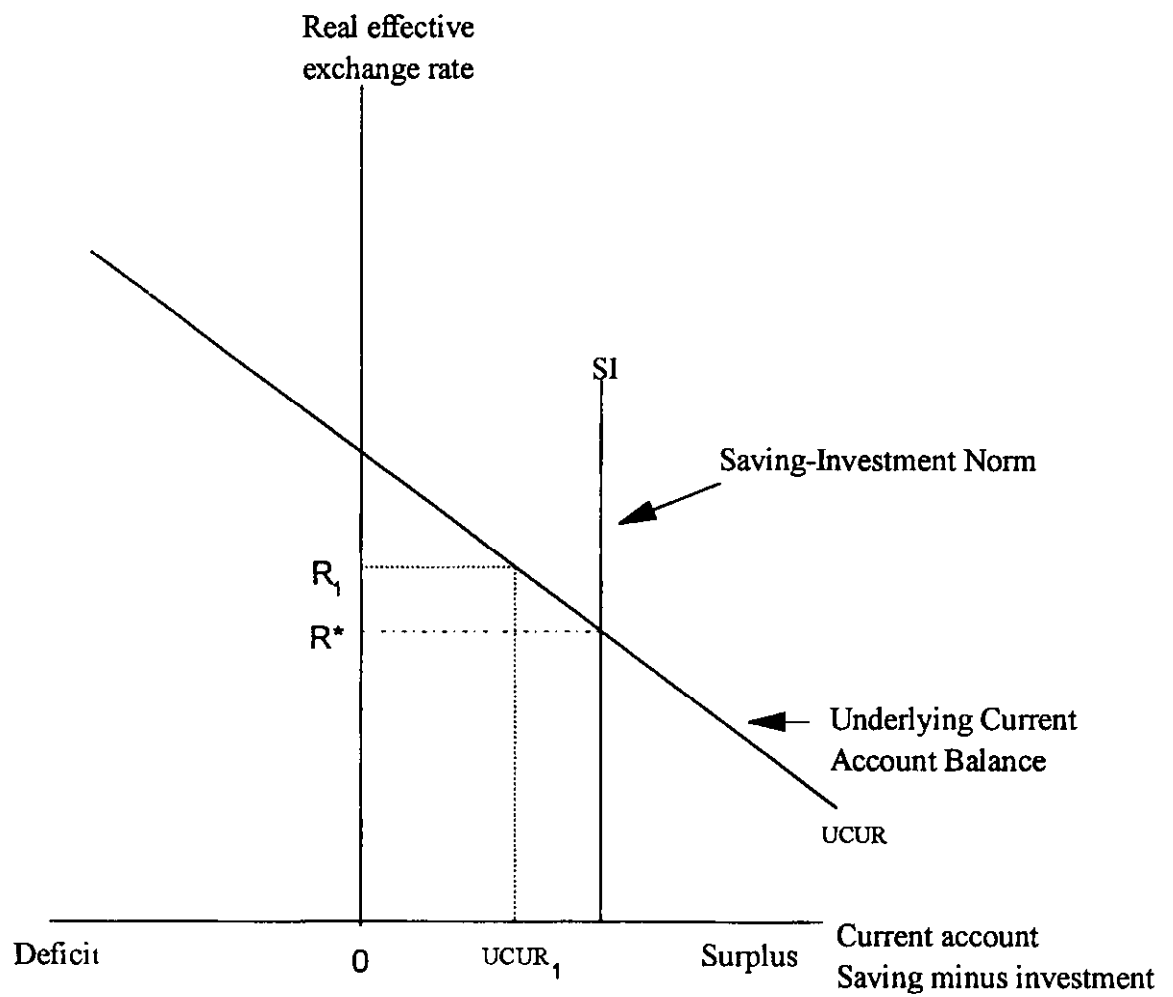
22. CGER's methodology can be viewed as an attempt to strengthen the macroeconomic balance framework—the second approach described above—building on equation (2), the national income accounting identity that links the current account (net exports) to the saving-investment balance. The assessment process has four steps, which can be illustrated using Chart 2. The first step involves the application of a trade-equation model to calculate the underlying current account positions that would emerge at prevailing market exchange rates if all countries were producing at their potential output levels; this focuses on the left-hand side of equation (2). As is clarified later in the paper, the relationship between the underlying current account and the real exchange rate can be depicted by the line labeled UCUR in the chart; the negative slope of this line implies that a depreciation (or decline) in the real exchange rate improves the underlying current account. If the real exchange rate was R_1 , the first step in the assessment process would identify the underlying current account position as $UCUR_1$.

23. The second step uses a separate model to estimate an “equilibrium” or “normal” position for saving-investment balances based on the medium-run determinants of saving and investment, also assuming that countries are operating at potential output; this step focuses on the right-hand side of equation (2). In Chart 2, the normal saving-investment balance is assumed to be independent of the level of the real exchange rate, as depicted by the vertical SI line.

24. The third step is to calculate how much exchange rates would have to change, other things equal, to be consistent with medium-run fundamentals—that is, to equilibrate the underlying current account positions with the medium-run saving-investment norms for each country simultaneously. Although this calculation is made in a multilateral framework, it is broadly similar to estimating the difference between R_1 and R^* , where R^* corresponds to the medium-run equilibrium exchange rate at which the UCUR and SI lines intersect.

²⁵A variant of the latter approach, which has so far not proved very successful, involves estimating a reduced-form exchange rate equation derived from the macroeconomic balance framework, rather than separate models of the current account and the saving-investment balance. See Mussa (1984) and Frenkel and Mussa (1985) on the conceptual framework; see Faruquee (1995) and MacDonald (1997) for empirical implementation of this approach.

Chart 2. Medium-Run Fundamentals



25. The final step in the process involves judgmental assessments of whether the calculations in step 3 suggest that any currencies are badly misaligned. As already emphasized (recall Box 1), large deviations between prevailing real exchange rates and estimates of the equilibrium levels consistent with medium-run fundamentals do not necessarily imply large misalignments. Moreover, estimates of equilibrium exchange rates cannot be placed within narrow statistical error bands, so the confidence that can be placed in estimated measures of misalignment is a matter of judgment.²⁶

26. Before further describing the successive steps in the assessment process, it is important to emphasize several points. First, the primary motivation for the analysis is to look for cases of badly misaligned exchange rates ("wrong rates"), not to prescribe exchange rate targets ("right rates"). Second, by focusing on the current account and saving-investment positions that would emerge if countries were producing at their potential output levels (i.e., were in positions of internal balance), the CGER approach provides a framework for assessing whether current accounts and exchange rates are appropriately related to other fundamentals from a *medium-run perspective*. Third, the approach also has the attractive features of assessing external positions and exchange rates within a *multilateral framework* and potentially in a manner that is *globally consistent*. Fourth, the direct focus of the analytic framework is on *real* multilateral exchange rates—that is, on trade-weighted averages of *nominal* exchange rates adjusted for relative national price levels;²⁷ when judging the appropriateness of current exchange rates, the distinction between real and nominal rates is typically irrelevant, but when focusing on exchange rates at some point in the future, the prospect of international inflation differentials can make the distinction quite important. Fifth, as mentioned earlier, the approach is intended to generate *inputs* for the Surveillance Committee to use as a starting point when assessing the appropriateness of prevailing exchange rates in the context of a broader range of considerations, including the cyclical positions of national economies and market participants' expectations of exchange rate movements over the medium term. And sixth, so far the CGER effort to arrive at multilaterally-consistent estimates of underlying current account positions and saving-investment norms has concentrated on forming assessments for exchange rates among the currencies of the major industrial countries, which have systemic importance;²⁸ more

²⁶It may also be noted here that when deviations from medium-run fundamentals lead to policy adjustments, the lines shown in Chart 2 will generally shift, as will the level of the medium-run equilibrium exchange rate. Such considerations are discussed further below.

²⁷Recall footnote 13.

²⁸In parallel with these assessments, area department staff, in preparation for Article IV consultations, have independently applied the methodology for a number of smaller industrial countries and a few developing countries and countries in transition, with assistance from the
(continued...)

generally, however, operational and research work on exchange rate issues continues to be carried out for many countries independently of the CGER process.

A. Underlying Current Account Positions

27. As already noted, the first step in the assessment process is to estimate each country's underlying current account position, defined as the external balance that would emerge at prevailing market exchange rates if all countries were operating at potential output. For this purpose, CGER has focused on two alternative sets of estimates. One comes from the current account projections generated by the Fund's country experts in connection with the *World Economic Outlook* (WEO) exercise.²⁹ This set of estimates has the advantage of incorporating the country-specific knowledge and judgments of the Fund's area department staff. The second set of underlying current account estimates is generated in the Research Department using a standard trade model that has a relatively simple structure and employs common equation specifications and parameter values across countries.³⁰ While relative simplicity and lack of country-specific detail are disadvantages, these RES model-based estimates have the positive attributes of global consistency and transparency. The RES model is also important in the third step of the CGER process (see below) for calculating the changes in exchange rates that would be needed to make current account balances consistent with medium-run equilibrium levels of saving-investment balances.

28. Various factors enter the calculations of underlying current account positions based on the RES trade model. The model has a standard structure: export volumes depend on the current and lagged values of the real effective exchange rate and on the weighted-average level of foreign activity (or aggregate demand); import volumes depend on the current and lagged values of the real exchange rate and the level of domestic activity. Other fundamental factors may also influence the current account, but rather than modeling them explicitly, the RES framework incorporates them implicitly by allowing the intercept (or baseline) for the current account to shift over time in accord with actual experience. Thus, fundamentals that are not explicitly modeled are diagnosed to have changed whenever the observed or estimated base-period level of the current account differs from its previous value by more (or less) than is explained by movements in exchange rates and activity levels.

²⁸(...continued)

Research Department staff.

²⁹The WEO projections are conditional on unchanged real exchange rates and assume that economies operate at potential output during the final year of the 5-year projection period.

³⁰The RES trade model is described in Bayoumi and Faruquee (1995) and Faruquee, Isard, and Masson (1996).

29. The RES-model estimate of the underlying current account is calculated by adjusting the most recent WEO estimate of the current account in the present year (the baseline) for the effects of closing the foreign and domestic output gaps (i.e., of setting the levels of domestic and foreign activity at potential output), as well as for whatever effects of past exchange rate changes are estimated to be still in the pipeline. Consistent with the stylized facts reported in surveys of standard trade equations,³¹ the RES trade model assumes that it takes three years for trade volumes to respond fully to changes in exchange rates.³² The model also assumes that the elasticities (percentage responsiveness) of export and import volumes to a given percentage change in the real exchange rate is identical across countries; thus, in terms of absolute magnitudes, an economy with relatively high ratios of exports and imports to GDP will experience relatively large changes in trade volumes in absolute terms (and as shares of GDPs) in response to a given percentage change in its real exchange rate.

30. Table 1 provides several hypothetical examples. Reflecting the considerations just discussed, the calculations start from current account positions during a base year (column 1) and depend on ratios of trade to GDP (column 2) along with the base-year values of domestic and foreign output gaps (columns 3 and 4, constructed as actual output minus potential output) and the amounts that real effective exchange rates have changed during the current and previous two years (columns 5, 6, and 7). The three hypothetical country cases (which are assumed not to constitute the entire world) have been distinguished in several ways. Country 1 has a lower ratio of trade to GDP than countries 2 and 3. Country 1 is operating somewhat above potential, while countries 2 and 3 are experiencing considerable cyclical slack. Trade-weighted-average foreign output gaps are somewhat lower for countries 2 and 3 than for country 1. All three countries have experienced exchange rate changes of equal magnitudes during the present and past two years, but countries 1 and 2 have experienced these changes more recently than country 3.

31. The last four columns of the table show the implications of these contrasting cases for underlying current account estimates, based on approximately the same elasticity parameters as those used in the RES trade model. The assumed closing of domestic output gaps over the medium run has a small positive effect on the underlying current account for country 1 and large negative effects on the current account positions of countries 2 and 3 (column 8); this reflects both the relative sizes of the domestic output gaps and the fact that countries 2 and 3 have considerably higher ratios of trade to GDP than country 1. The closing of foreign output gaps has larger effects in countries 2 and 3 than in country 1 (column 9), despite the smaller size of the gaps in the former cases; this results from the smaller openness (i.e., trade-to-GDP)

³¹See Goldstein and Khan (1985).

³²In addition, the model assumes that import prices respond fully and with no lags to exchange rate changes, and that export prices (measured in the exporter's currency) are not directly influenced by exchange rates.

Table 1. Underlying Current Account Calculations

	Base-Year Estimates							Projected Change in Current Account Due to			Underlying Current Account
	Current Account	Ratio of Trade to GDP	Domestic Output Gap	Foreign Output Gap	Percent Change in Real Effective Exchange Rate 1/			Closing Domestic Output Gap	Closing Foreign Output Gap	Effects of Exchange Rate Changes	
					Current Year	Previous Year	Two Years Previous				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Country 1	-2.0	10	1	-3	10	0	0	0.15	0.45	-0.65	-2.0
Country 2	2.0	25	-3	-2	-10	0	0	-1.15	0.75	1.60	3.2
Country 3	0.0	25	-3	-2	0	0	-10	-1.15	0.75	0.60	0.2

1/ Positive number indicates appreciation.

ratio in country 1. The relative impacts of exchange rate changes in the three cases (column 10) reflect, first, the fact that country 2 is more open than country 1, and hence that a given percentage change in the exchange rate generates a larger absolute change in the ratio of the current account to GDP for country 2, and second, the fact that base-year current account positions already include most of the effects on country 3, which experienced an earlier depreciation than country 2.

32. It should be apparent from the previous paragraph that the illustrative calculations are based on a streamlined trade model and have not taken account of any projected changes in net factor income payments or transfers over the medium run.³³ As mentioned earlier, area department projections of current account positions at the end of the WEO horizon (under the assumption of constant real exchange rates) can be viewed as an alternative set of measures of underlying current accounts. The availability of two alternative estimates of underlying current account positions provides a useful check to identify anomalies in either estimating procedure. One important conceptual difference between the two estimates is that the WEO projections apply to the terminal year in the WEO horizon, currently 2002, whereas the underlying current account estimates based on the RES trade model are measures of what current account positions would be in the present year if countries were producing at potential and the effects of past exchange rate changes had been fully realized.³⁴ That being recognized, however, the differences between the WEO and RES model-based estimates usually are relatively small. When differences are more substantial, CGER has tended to put more emphasis on the WEO forecasts in assessing what current account balances are likely to be in the medium run if real exchange rates remain constant.

33. Without even preceding beyond step one of the process, the estimates of underlying current account imbalances can be useful in preliminary judgments about possible exchange rate misalignments. Specifically, if the underlying current account balance is significantly outside the range of current account balances that a country has normally experienced, this can be an indicator of potential misalignment. The focus on the underlying current account, rather than the present current account balance, can be important. If a country has a substantial present current account imbalance but this imbalance may reasonably be expected

³³RES is in the process of refining its trade model in certain directions, partly for purposes of modifying the exchange rate assessment framework in the context of EMU. However, given resource constraints and the priority attached to global coverage and multilateral consistency, the structure of the RES trade (or current-account) model is likely to remain relatively streamlined.

³⁴The RES model is not well suited for projecting current account positions five years ahead, or for estimating underlying current account positions as of 2002, since it has a simplified structure that precludes explicit allowance for projected changes over time in explanatory variables other than output and real exchange rates.

to shrink (to a smaller underlying position) because of the effects of past exchange rate changes and future cyclical developments, then the present configuration of exchange rates may not appear problematic.³⁵ On the other hand, a somewhat smaller prevailing imbalance that is expected to grow substantially at prevailing real exchange rates may be more problematic.

B. Saving-Investment Norms

34. The first step in the process, as described above, focuses on the determinants of the current account balance, CUR, on the left hand side of equation (2). The second step seeks to establish a standard for the “equilibrium” level of the current account by assessing the “normal” expected level of the saving-investment balance, S-I, on the right hand side of equation (2). There are several ways in which estimates of a “normal” saving-investment balance might be derived. The staff has considered more than one approach and intends to continue to investigate this issue as it seeks to improve its analysis and extend it to a broader range of countries.

35. At present, the starting point for specifying its S-I norms is to focus on the fitted values of a set of equations (referred to as the RES S-I model)³⁶ that relate the saving-investment balance to various medium-run determinants. This approach involves the estimation of a set of equations with consistent specifications and parameter values across countries; and, in this respect, CGER’s methodology is a step forward—in terms of global consistency and transparency—from the relatively ad hoc approaches that others have taken in specifying equilibrium levels for current account positions.³⁷

36. In the specification of the RES S-I model, the variables that are assumed to be the main direct determinants of saving and investment in the medium run are different than the

³⁵Although the discussion here abstracts from the fact that current account developments sometimes reflect significant structural changes, it is important to take account of relevant structural shifts in the assessment process, preferably in arriving at modified estimates of underlying current account positions, and otherwise in the final judgmental step of the process.

³⁶The model was developed in the Research Department; see Debelle and Faruquee (1996) and Faruquee, Isard, and Masson (1996).

³⁷Compare, for example, the approach of Williamson and Mahar (1996).

variables that enter the current account model.³⁸ In particular, each country's saving-investment balance is assumed to depend on five variables: its stage of development, as represented by its per capita income position; its demographic structure, as summarized by a dependency ratio;³⁹ its fiscal position; the gap between its actual and potential output levels; and the level of world interest rates. The fact that aggregate saving must equal aggregate investment for the world as a whole provides a condition that relates the level of world interest rates to the other variables in the model, so that the world interest rate can be substituted out of the model. This leads to reduced-form equations in which each country's saving-investment balance depends on its per capita income level relative to a GDP-weighted average of per capita incomes in the world as a whole, as well as on the relative levels (compared with world GDP-weighted averages) of its dependency ratio, fiscal position, and output gap.⁴⁰ The model also includes country-specific constant terms to allow for other factors that may influence the relative saving and investment rates of different countries, but it does not include the exchange rate among the main direct determinants of saving or investment.⁴¹

37. Estimation of the RES S-I model produces the following results (when other things are held constant): Countries with higher relative per capita incomes tend to have relatively high saving-investment balances. Higher dependency ratios imply lower saving-investment balances. An increase in the domestic output gap (excess of actual over potential output) has a negative effect on the saving-investment balance. Changes in the fiscal position tend to have

³⁸As will become apparent below, the CGER framework essentially focuses on whether *ex ante* projections of medium-run S-I balances seem badly out of line with *ex ante* estimates of underlying current account positions, given prevailing exchange rates and policies. Such focus aims to identify situations in which exchange rates, policies, or some other economic factors will have to adjust, given that the saving-investment balance and the current account must be identical *ex post*.

³⁹The measure used here is the ratio of the population aged 19 and younger or 65 and older (combined) to the population aged 20 to 64.

⁴⁰Faruquee, Isard, and Masson (1996) derive the reduced form specification and summarize the equation estimates; Debelle and Faruquee (1996) provide a detailed and more extensive description of empirical results. The S-I equations have been estimated using panel data for the industrial countries. Because of data limitations, the estimation has not been extended to the developing and transition economies.

⁴¹This is a simplifying assumption, consistent with most other empirically-estimated models of saving and investment. A more complete macroeconomic framework could recognize that real exchange rates may influence saving and investment through their effects on income distribution, the terms of trade, and the profitability of the tradable goods sector.

“non-Ricardian” effects; that is, an increase in the fiscal surplus is not fully offset by a decline in private saving and therefore has a positive effect on the saving-investment balance.⁴²

38. For purposes of calculating medium-run “norms” for the saving-investment balance, the estimated equations are evaluated with output gaps set to zero, with per capita incomes corresponding to the levels that would prevail if output was at potential, and with fiscal balances at (smoothed values of) the structural budget positions reported in the WEO. Note that these structural budget positions do not necessarily correspond to “desirable” fiscal balances. For most of the major industrial countries, CGER’s S-I norms also include adjustments (from the RES model-based estimates) for various considerations that individual country desks regard as relevant,⁴³ as well as adjustments explicitly incorporated into the RES model-based estimates to deal with the medium-run effects of German unification, which was associated with a substantial downward shift in Germany’s S-I balance.⁴⁴

39. The RES model-based estimates of the normal levels of S-I balances for the G-7 countries—corresponding to actual and projected structural fiscal positions, dependency ratios, and per capita incomes—are illustrated in Chart 3 for the period from 1982 through 2002, the terminal year in the five-year WEO projection horizon.⁴⁵ (These estimates include adjustments for the medium-run effects of German unification but exclude the additional adjustments that enter CGER’s assessments.) For the United States, the S-I norm is always in deficit during this period; that is, the normal level of domestic saving is less than the normal

⁴²There is a long-standing debate on the economic implications of public deficits; see Barro (1989) and Bernheim (1989) for reviews of the Ricardian and neoclassical perspectives. Whether the effects of an increase in the fiscal surplus on aggregate saving are positive, negligible, or even negative is related to the particular economic circumstances, including debt sustainability and capital market imperfections. Further work investigating cross-country experiences with respect to the effects of fiscal policy may prove useful in better understanding these issues and perhaps refining the model on which the S-I norms are based.

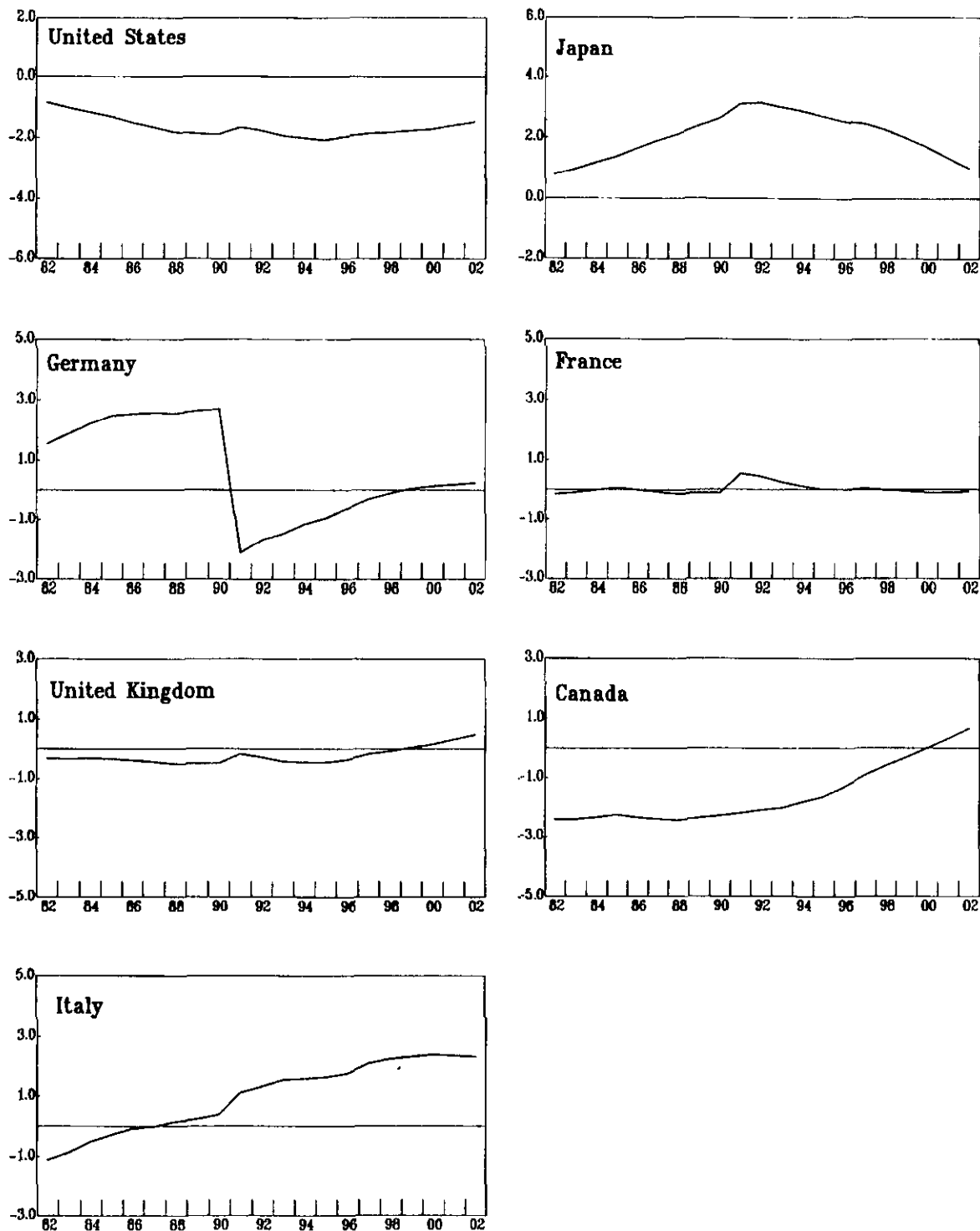
⁴³In the case of Japan, the norm is based on a saving-investment model estimated by the Asia and Pacific Department.

⁴⁴In future work on countries that CGER has not yet analyzed, it may be relevant in some cases to focus on the initial stock of net foreign assets or liabilities (in proportion to GDP) as a major consideration in specifying norms for saving-investment flows. This is particularly the case for countries that have limited or highly variable access to international capital markets, where the level and composition of net foreign liabilities need to be incorporated into assessments of medium-term external sustainability.

⁴⁵The extension of these S-I norms through 2002 is based on the WEO projections of the variables that enter the saving and investment equations.

Chart 3. RES Model-Based Estimates of Normal Saving-Investment Balances for the Major Industrial Countries

(In percent of GDP)



level of domestic investment, reflecting both the structural budget position of the public sector and the relatively low level of private saving. The modest upturn in the U.S. S-I norm beginning in 1995 mainly reflects the actual and projected improvement in the public sector's structural budget position. For Japan, the S-I norm is persistently in surplus, partly reflecting a relatively high national saving propensity associated with a relatively low dependency ratio. The time profile of Japan's normal S-I position partly reflects (smoothed) movements in the structural budget deficit of the public sector. In addition, projected population aging in Japan has direct effects on the saving-investment balance (at a given fiscal position), as well as indirect effects via its influence (through the social security system) on the projected fiscal balance. For Germany, the big shift in the S-I norm from significant surplus to deficit reflects the direct impact of German unification and the associated shift in German fiscal policy; the estimated equations include a set of dummy variables to capture both the impact and the gradual erosion over time of the unification effect, and counterpart adjustments are made to the norms for other countries in proportion to their shares in Germany's imports. The uptrend of the German S-I norm after 1991 also reflects the gradual correction of the structural fiscal position. For France and the United Kingdom, the S-I norms are close to zero, but increase moderately in 1991 as counterparts to the unification effect for Germany. In the U.K. case, the modest trend over time mainly reflects (smoothed) movements in the structural fiscal position of the public sector. Similarly, for Canada the substantial rise of the S-I norm over the two-decade period covered in Chart 3 mainly reflects the cumulative shift in the structural fiscal position. In the Italian case, about half of the rise in the S-I norm reflects a relatively large decline in Italy's dependency ratio over the period from 1982 through 1995.

C. Exchange Rates Consistent with Medium-Run Fundamentals

40. When the underlying current account balances determined in step one of the process differ from the norms for the saving-investment balances determined in step two, the implication is that either exchange rates or other variables (including policies) will need to change from present levels over the medium term to be consistent with (projected) medium-run fundamentals. Step three of the process assumes that other things remain equal and determines the direction and magnitude of the implied exchange rate changes.

41. To illustrate the logic of what is done in step three, applied to the real effective exchange rate of a single country viewed in isolation, it is helpful to focus again on Chart 2. Recall that the negatively sloped UCUR line plots the underlying current account position of the country in question as a function of that country's real effective exchange rate. The UCUR line is constructed under the assumption that the exchange rate is held constant at the level shown on the vertical axis, and that all lagged effects of past exchange rate changes have been accounted for. This line is also based on the assumption that output is equal to potential in the country in question and in all of its trading partners. The UCUR line is negatively sloped to reflect the presumption that a lower real effective exchange rate (which strengthens a country's international competitiveness) is associated with an improvement in the current

account over the medium term, other things equal. Changes in economic fundamentals that directly affect the underlying current account at a given level of the real exchange rate (such as changes in relative productivity that alter competitiveness) are reflected in shifts of the position of the UCUR line.

42. The vertical SI line in Chart 2 shows the normal level of the saving-investment balance determined in step two of the CGER process. The line is vertical because the normal level of the S-I balance (at potential output) is assumed not to depend on the exchange rate.⁴⁶ The point at which the SI line intersects the UCUR line determines the equilibrium level of the real effective exchange rate (R^*) that is assessed to be consistent with medium-run fundamentals.

43. From Chart 2 it is clear that changes in economic fundamentals that shift either the position of the vertical SI line or the negatively sloped UCUR line will alter the real effective exchange rate that is consistent with medium-run fundamentals. In particular, from the analysis in step two it follows that, other things constant, a higher relative level of real per capita income, or a reduction in the (relative) dependency ratio, or a rise in the (relative) structural fiscal surplus will shift the SI line in Chart 2 to the right and will imply a lower medium-run equilibrium level of the real effective exchange rate. The size of this implied change in the equilibrium exchange rate will depend on the extent of the shift in the vertical SI line and on the slope of the UCUR line. Shifts in the position of the UCUR line, due to changes in medium-run fundamentals that affect the current account through channels other than real exchange rates, also change the equilibrium level of the real effective exchange rate that is assessed to be consistent with medium-run fundamentals, but do not change the medium-run levels of either the saving-investment balance or (correspondingly) the current account balance.

44. More generally, changes in economic fundamentals may affect both the medium-run saving-investment norm and the position of the UCUR line. For example, a relative improvement in a country's productivity in its tradable goods industries will improve international competitiveness (provided that relative real wages and other factor costs rise less than proportionately in the tradable sector), and this will be reflected in an upward (and rightward) shift of the UCUR line. Such a relative productivity improvement will also tend to increase the S-I norm by raising relative per capita income and perhaps also by improving the government's fiscal position. Provided that the rightward shift of the UCUR line exceeds that of the SI line, the medium-run equilibrium level of the real exchange rate will appreciate and the current account surplus will rise as a consequence of such a change in economic fundamentals.

⁴⁶As noted earlier, this simplifying assumption could be relaxed in principle (implying a non-vertical SI line) but is consistent with many other empirical models of saving and investment behavior.

45. It should be noted that changes in economic fundamentals that affect the position of the UCUR line appear to be quite important in practice. Specifically, in terms of the analytical framework summarized in Chart 2, a good deal of the movements observed over the medium run in real exchange rates and in saving-investment (or current account) balances is inconsistent with the supposition that most of the action comes from shifts of a vertical SI line against a relatively fixed UCUR line. Unfortunately, while it is possible to conclude after the fact that underlying fundamentals must have been changing in ways that shifted significantly the position of the UCUR line (as well as the SI line), it is often not possible to diagnose such changes in fundamentals as they are happening, let alone to predict them in advance.

46. To move from the analysis of the equilibrium level of the real effective exchange rate of a single country summarized in Chart 2 to conclusions about the equilibrium configuration of exchange rates in a multi-country world, some difficulties must be confronted. Because in an n-country world there are only n-1 independent exchange rates, it is not feasible to apply Chart 2 independently to all countries (or regions) without imposing a mathematical requirement for global consistency. It is also important to assure that the global current account position implied by the configuration of equilibrium exchange rates is reasonable, or more specifically, that the simultaneous movement in all exchange rates from prevailing to equilibrium levels would not significantly affect the global current account discrepancy.⁴⁷

D. Judgmental Assessments

47. The final step in the assessment process is to reflect on whether the estimates of the exchange rates consistent with medium-run fundamentals suggest that any currencies are badly misaligned. In general, if differences between present market exchange rates and estimated medium-run equilibrium exchange rates are small (less than 5 percent or so), there is a very strong presumption against any conclusion of serious misalignment. After all, the CGER framework used to determine estimates of medium-run equilibrium exchange rates clearly has its limitations, and considerable deference should be accorded to the market before suggesting any conclusion of serious exchange rate misalignment. For the same reasons, modest differences between market exchange rates and estimated medium-run equilibrium rates (differences of 10 percent or so) would surely not trigger any automatic conclusion of misalignment, although they might suggest further investigation in some circumstances where other judgmental considerations (discussed below) raised concerns. Significant deviations

⁴⁷Faruquee (1996) provides a detailed description of the procedures used to assure these global consistency requirements, which are difficult to summarize without extensive mathematical notation. It may be comforting to note that, given the global consistency properties of the RES trade and S-I models, the results of calculating equilibrium exchange rates in a multilateral framework generally do not deviate materially from those derived by focusing on countries individually (as in Chart 2).

from estimated medium-run equilibrium exchange rates (deviations of about 15 percent or larger) raise the warning flag of possible exchange rate misalignment and warrant serious consideration of other judgmental factors before concluding either that exchange rates are misaligned or that the situation is apparently benign. The "significance" of deviations from estimated equilibrium exchange rates does depend to some degree on the specific countries involved. Among the currencies of closely-linked economies, such as those of the continental European countries, or of Canada and the United States, the range of bilateral real exchange rate movements that can be plausibly regarded (or tolerated) as consistent with an unchanged set of medium-run fundamentals (given the relatively high responsiveness of bilateral trade flows, in such cases, to movements in real bilateral exchange rates) is somewhat narrower than that among the currencies of Germany, Japan, and the United States.

48. Before reaching any conclusion about exchange rate misalignments, it is important to take account of several judgmental factors. Relevant considerations include the following.

49. First, it is important to take account of cyclical and related monetary and financial conditions in various countries. If cyclical conditions are strong and monetary conditions are also firm in one country, while cyclical conditions are relatively weak and monetary conditions are easy in another country, then it is reasonable to expect that the exchange rate of the first country's currency against that of the second will be strong relative to the medium-run equilibrium value suggested by the CGER analytical framework. In this relative cyclical situation, an overvaluation of country-one's currency (vis-à-vis currency two) by ten or fifteen percent relative to estimates of its medium-run equilibrium position would probably be interpreted as a normal and desirable reflection of cyclical conditions, rather than as an indication of exchange rate misalignment. On the other hand, in this same relative cyclical situation, an undervaluation of currency one by ten or fifteen percent would raise serious concerns about a possible exchange rate misalignment.

50. Second, to get a quantitative notion of how much relative cyclical positions and related factors may be influencing the shorter-run behavior of exchange rates, it is often useful to examine short- to medium-term interest rate differentials adjusted for differences in expected inflation rates. In the example discussed in the preceding paragraph, a real interest rate differential of two percent per year for country-one above country-two over a five year horizon would suggest that financial markets are expecting a 10 percent real depreciation of country-one's currency relative to country-two's currency over this horizon.⁴⁸ Of course, in

⁴⁸A substantial body of empirical research shows that interest rate differentials are not good predictors of changes in exchange rates over short horizons; the differentials often predict the exchange rate change with the wrong sign. The presumption in CGER discussions is that real interest rate differentials are more reliable in assessing market expectations of medium-term developments in real exchange rates, although this presumption is subject to question in

(continued...)

this example if the real interest rate differential pointed in the other direction—toward further real appreciation of an exchange rate that already appeared potentially overvalued—then there would be increased cause for concern.

51. Third, the exchange rate implications of the fiscal situation require careful attention when fiscal imbalances are large and possibly unsustainable. Recall that the estimates of medium-run equilibrium exchange rates reflect norms for saving-investment balances that incorporate the effects of structural fiscal positions. If a country has a large structural fiscal deficit, it tends (other things equal) to have a lower S-I balance and, according to the framework summarized in Chart 2, a strong equilibrium real exchange rate. There are numerous examples of this phenomenon, including the strong U.S. dollar in the early 1980s and the strength of the deutsche mark after German unification. However, there are also situations (such as in the case of Italy in 1995, as discussed further below) where a country's structural fiscal deficit may be viewed as unsustainable in the medium or longer term, and the financial market reaction to such a situation may, quite understandably, tend to produce a relatively weak currency rather than a relatively strong one. In such situations, it is not reasonable to base an assessment of a country's medium-run equilibrium exchange rate on an estimate that assumes an apparently unsustainable fiscal position. Rather it is appropriate to recognize that the estimate of the medium-run equilibrium exchange rate should be modified downward to be consistent with a significantly smaller and more sustainable fiscal deficit. If the market exchange rate is significantly below this revised estimate of medium-run equilibrium, a judgment must be made as to whether the market is over-reacting to an adverse situation for which corrective fiscal actions have already been taken, or whether the apparent undervaluation is more appropriately ascribed to the failure of the authorities in question to take action sufficiently convincing to assure the correction of their fiscal imbalance.

52. Fourth, it is clear that underlying structural conditions that affect medium-run equilibrium real exchange rates may change over time. In particular, there has been a long-term trend toward real effective appreciation of the Japanese yen (especially if real exchange rates are measured using consumer price indices), and there was a substantial apparent downward shift in the real exchange rate of the U.S. dollar against European currencies and the Japanese yen sometime in the early 1970s. Similarly, it appears that German unification has also induced a persistent shift in equilibrium real exchange rates (after allowing separately for the effects of the change in Germany's fiscal position). And, the list does not end with these examples. The difficulty is in knowing when such structural changes are occurring and are likely to persist in the future. There is no simple resolution of this difficulty, but the detailed economic analysis of individual countries is a valuable input in any attempt at resolution.

⁴⁸(...continued)
particular circumstances.

53. In summary, the four step CGER process for diagnosing possible misalignments among major currency exchange rates is a combination of formal analysis using an explicit multi-country framework, detailed understanding of the economic situations in individual countries, and bottom-line judgments factoring in other relevant considerations. The formal analysis imposes an important degree of rigor and consistency. The detailed knowledge provides essential input to the formal analysis and helps to inform the bottom-line judgment. The final judgment takes account of realities beyond the formal framework and recognizes the limitations of the whole exercise. In the end, the CGER process is rather like cooking: the proof of the pudding is in the eating.

IV. LIMITATIONS AND EVALUATION OF THE CGER FRAMEWORK

54. Like other applications of the macroeconomic balance approach, the CGER framework can be criticized for not employing a more fully specified and dynamic multi-country econometric model. Such dynamic models generate complete future timepaths for equilibrium exchange rates; though, unfortunately, the models generally do a very poor job of replicating the historically observed empirical behavior of exchange rates. By contrast, the CGER approach simply generates a point estimate of the medium-run “equilibrium” exchange rate, rather than a timepath of the equilibrium exchange rate stretching from the short run to the long run. Thus, even though the CGER framework might be viewed as an advance over other macroeconomic balance frameworks⁴⁹—in the sense that it moves toward a global and multilaterally consistent set of trade equations and also attempts to generate S-I norms in a systematic and globally consistent way—it needs to be recognized that its numerical assessments are derived from a simplified analytic framework. As emphasized above, in the absence of a complete dynamic framework, judgments about cyclical considerations need to be superimposed on CGER’s estimates of equilibrium exchange rates for the medium run.⁵⁰

⁴⁹For a recent alternative application of the macroeconomic balance framework to the G-7 countries, see Wren-Lewis and Driver (1997), which uses “S-I norms” (current account targets) generated by Williamson and Mahar (1996).

⁵⁰Although it might seem natural, as an alternative approach, for CGER to attempt to incorporate MULTIMOD into its assessment framework, such an effort would not be straightforward. This is because MULTIMOD has been designed to analyze the effects of various shocks on a WEO baseline scenario, not to generate a baseline forecast itself. Thus, while MULTIMOD can be used to explore the interactions between policy adjustment and exchange rate adjustment in responding to shocks, it is not as well suited for analyzing whether the baseline forecast itself—namely, the judgmental forecast associated with the WEO—is likely to give rise to exchange market tensions. That being said, however, Meredith
(continued...)

55. A second limitation of the framework is the uncertainty surrounding the estimates of medium-run "equilibrium" exchange rates. Uncertainty about the appropriate specifications for trade equations and the estimated values of elasticity parameters implies imprecision both in the underlying current account estimates and in the calculated magnitudes of the changes in exchange rates required to reconcile given estimates of underlying current account positions with given saving-investment norms. Additional uncertainty surrounds the equation specifications and estimated parameters that underlie the saving-investment norms. The different sources of uncertainty interact in a way that makes it virtually impossible to calculate (or simulate) statistical confidence bands unless one resorts to unrealistic simplifying assumptions. In the absence of formally calculated confidence bands, as alluded to earlier, the staff has tended to regard deviations of up to 10 or even 15 percent from its estimates of equilibrium exchange rates as within a range that is not necessarily significant.

56. How well does this approach work? CGER does not have a long history of generating exchange rate assessments, and its methodology for deriving saving-investment norms has been evolving, but it is possible to construct approximate estimates of what the present methodology would have suggested on various occasions for which there is now a fairly strong ex-post consensus that prevailing exchange rates were substantially misaligned.

57. For this purpose, the remainder of this section provides retrospective assessments of the exchange rates of the G-3 countries in February 1985 and April 1995, as well as the exchange rates of the major European countries in June-July 1992. It should be recognized that such retrospective assessments abstract from two important considerations. First, the historical data that are used as measures of base-year current accounts, output gaps, structural fiscal positions, and the other variables that enter the calculations of underlying current account positions and S-I norms may sometimes represent significant revisions from the estimates or projections that would have been used during the particular months for which exchange rates are being retrospectively assessed. Second, the calculated underlying current account positions and S-I norms are based entirely on the RES trade and S-I models, without the benefit of whatever relevant adjustments might have been suggested at the time by the Fund's country experts.

⁵⁰(...continued)

(1997) has recently used a variant of the Japanese block of MULTIMOD to generate a plausible baseline forecast for Japan and to simulate a dynamic path of the equilibrium exchange rate for the yen. Meredith's analysis involved some modifications of the general specification of MULTIMOD as well as re-estimation of the trade equations for Japan. His conclusions about equilibrium exchange rates for the yen were broadly similar to the conclusions reached using CGER's methodology.

58. With these caveats in mind, Table 2 provides a retrospective assessment of what the methodology would have suggested about prevailing market exchange rates for the G-3 countries in February 1985, the month in which the effective exchange rate of the U.S. dollar reached its peak. The calculations use annual data for 1985 as the base-year magnitudes of current account positions, output gaps, and so forth. The assessments in the table indicate that on a real multilateral basis, the dollar was substantially overvalued (46 percent) and the yen substantially undervalued (35 percent), while the mark was slightly undervalued (6 percent).⁵¹

59. Estimates of real equilibrium bilateral rates against the U.S. dollar indicate a significant overvaluation of the dollar versus the mark (also 46 percent), but the multilateral rate for the mark with its heavy weight on other European currencies provides only a pale reflection of this situation. Notably, the dollar and yen respectively depreciated and appreciated substantially over the following two-year period (recall Chart 1), while the mark appreciated slightly on a real multilateral basis and quite substantially vis-à-vis the dollar.

60. The next retrospective assessment provides a snapshot of what the methodology would have suggested about the alignments of the deutsche mark, the French franc, the lira, and the pound sterling just prior to the summer-1992 crisis in European exchange markets. It may be recalled that the tremendous pressures that were unleashed in exchange markets that summer led to the withdrawal (in mid-September) of sterling and the lira from participation in the Exchange Rate Mechanism (ERM) of the European Monetary System, and subsequently to sharp depreciations of both currencies. The franc also came under strong downward pressure, which persisted off and on through August 1993, when the fluctuation bands of the ERM were widened considerably.

61. Table 3 presents a hypothetical assessment of the average exchange rates that prevailed in June-July 1992, using annual data for 1992 as the base-period magnitudes of the other variables that enter the calculations. Analysis at the time, based on CGER's present methodology, would have focused first on the size of underlying current account imbalances (column 2), noting that Italy and the United Kingdom had underlying deficits in the neighborhood of 2 ½ percent and 3 ¾ percent of GDP, respectively, while Germany and France had relatively small underlying imbalances. Thus, Italy and the United Kingdom would have stood out, independently of specific estimates of S-I norms, as the subset of the four countries whose currencies seemed most vulnerable at the time to strong market pressures, other things equal.

62. Had the CGER assessment framework and the Surveillance Committee been in operation during June-July 1992, a range of judgments on appropriate S-I norms would probably have been collected and then compared with alternative estimates of underlying

⁵¹These crude retrospective assessments do not make adjustments for any "expected" exchange rate changes that may have been reflected in medium-term interest rate differentials.

Table 2. Assessment of Exchange Rates Prevailing in February 1985

	Current Accounts			Medium-Run Equilibrium Real Exchange Rate 1/
	1985 Actual	Underlying	S-I Norm	
	(In percent of GDP)			(Percent deviation)
United States	-3.0	-3.4	-1.3	-46
Japan	3.7	4.5	1.4	35
Germany	2.5	3.3	2.5	6

1/ Positive number indicates that prevailing exchange rates were "undervalued" relative to their estimated medium-run equilibrium levels.

Table 3. Assessment of Exchange Rates Prevailing in June-July 1992

	Current Accounts			Medium-Run Equilibrium Real Exchange Rate 1/
	1992 Actual	Underlying	S-I Norm	
	(In percent of GDP)			(Percent deviation)
Germany	-1.0	-0.4	-1.8	10
France	0.3	0.3	0.4	1
Italy	-2.4	-2.5	1.3	-29
United Kingdom	-1.7	-3.7	-0.3	-21

1/ Positive number indicates that prevailing exchange rates were "undervalued" relative to their estimated medium-run equilibrium levels.

current account imbalances. For present purposes, however, Table 3 restricts attention to norms calculated from the present RES S-I equations (column 3). Based on these norms, CGER's analysis would have suggested that the lira and pound sterling were overvalued by about 30 and 20 percent, respectively, while the franc was appropriately valued on a multilateral basis and the mark about 10 percent undervalued.⁵²

63. The third retrospective exercise applies the present methodology to the exchange rates of the G-3 countries during April 1995. As summarized in Table 4, the retrospective assessment, using realized data for 1995 as base-year numbers, suggests that the yen was about 30 percent overvalued on a multilateral basis, with the dollar nearly 20 percent undervalued.⁵³ On a real multilateral basis the deutsche mark appears to have been only modestly overvalued (by 8 percent), but comparison of actual bilateral rates with estimates of equilibrium bilateral rates suggests a more substantial overvaluation vis-à-vis the U.S. dollar (20 percent).

64. The conclusion that the major currencies were misaligned would presumably have been reinforced by judgmental assessment of the implications of real interest rate differentials. Looking over a five-year horizon from April of 1995, by any reasonable estimate U.S. real interest rates exceeded Japanese real interest rates by at least 2 percent per year, suggesting that financial markets were implicitly expecting a further real appreciation of the yen against the dollar of at least 10 percent over the coming five years from its already very strong level.

65. Thus, based on the retrospective applications summarized in Tables 2-4, it seems valid to conclude that the present CGER methodology would have delivered "correct signals" in the cases that are widely regarded as the most extreme misalignments of major currencies during the 1980s and 1990s. This is only a weak test of the present methodology, and it should not be taken to suggest that the methodology would never have delivered incorrect signals about major misalignments. One important safeguard against incorrect signals is the practice of focusing on at least two alternative sets of underlying current account estimates, and of analyzing the basis for any substantial differences between the estimates. There can be cases in which the WEO projections of underlying current account positions incorporate important

⁵²A more traditional approach that focused on purchasing power parities and other competitiveness indicators and noted also the substantial current account deficits of Italy and the United Kingdom would also have suggested that these currencies were somewhat overvalued in the summer of 1992. Moreover, the cyclical situation in the U.K. suggested that it was not appropriate from a domestic policy perspective to maintain a high interest rate policy to defend sterling's peg in the ERM in the face of the Bundesbank's necessary efforts to combat German inflation. Accordingly such a policy was somewhat lacking in financial market credibility.

⁵³Meredith (1997, para. 28) suggests that the yen was 25 percent overvalued.

Table 4. Assessment of Exchange Rates Prevailing in April 1995

	Current Accounts			Medium-Run Equilibrium Real Exchange Rate 1/
	1995 Actual	Underlying	S-I Norm	
	(In percent of GDP)			(Percent deviation)
United States	-1.8	-0.7	-2.1	19
Japan	2.2	0.9	2.6	-31
Germany	-0.9	-1.9	-1.0	-8

1/ Positive number indicates that prevailing exchange rates were "undervalued" relative to their estimated medium-run equilibrium levels.

country-specific factors that are overlooked by the simplified RES trade-model framework, and there can be situations in which the systematic and globally-consistent properties of the RES calculations may raise questions about the WEO projections for certain countries.

V. RECENT APPLICATIONS IN THE CONTEXT OF FUND SURVEILLANCE

66. The last section demonstrated that *hypothetical*, retrospective assessments based on the CGER methodology would have performed quite well on those occasions during the 1980s and 1990s for which it is generally agreed that some of the major currencies were badly misaligned. It is also instructive to review how *actual* Fund surveillance in the recent past has been informed and reinforced by assessments of exchange rates relative to fundamentals. This section looks at three cases, starting with the sharp movements of the G-3 currencies in the spring of 1995 (but with a different focus than the previous section), and then addressing the lira in the run-up to ERM reentry in the fall of 1996, and the appreciation of the dollar against the yen and deutsche mark earlier this year.⁵⁴

A. The Constellation of the U.S. Dollar, Yen, and Deutsche Mark Exchange Rates in the Spring of 1995

67. Between December 1994 and April 1995, on a multilateral basis the real effective value of the yen appreciated by 19 percent, the deutsche mark appreciated by 7 percent, and the U.S. dollar depreciated by 9 percent. (From the beginning of 1994, the changes were 29, 10, and 14 percent respectively.)⁵⁵ At the start of 1995, the Fund's views on G-3 exchange rates were muted, reflecting differences of views about the confidence that could be placed in market judgments of exchange rates and the extent to which the Fund should publicize its concerns. But by early March, it had become increasingly clear that exchange rates between the major industrial countries had become misaligned relative to fundamentals. The judgment that policies should be adjusted in light of this misalignment was subsequently a key feature of Fund surveillance throughout the remainder of 1995.

68. In forming its judgment that the major currencies were misaligned, the Fund staff drew inter alia on the CGER methodology. By the fall of 1994, the staff had begun to compare

⁵⁴For a more comprehensive review of industrial country exchange rate policies in the context of surveillance, see *Review of Members' Policies in the Context of Surveillance* (SM/96/55, 3/5/96, pp. 9-15).

⁵⁵These figures are drawn from the Fund's *Information Notice System* (INS) based on unit labor cost comparisons.

systematically estimates of underlying current account balances with norms, beginning initially with the G-7 countries.⁵⁶ Staff's estimates using the macroeconomic balance approach were then combined with other measures of competitiveness—including estimates of purchasing power parity and trends in the trade accounts—in a relatively informal manner to produce summary assessments of the exchange rate and policy recommendations that were then discussed by the Surveillance Committee in a series of meetings into the spring of 1995.⁵⁷ The judgment that recent movements in the G-3 exchange rates had gone farther than warranted by fundamentals, together with then-prevailing perceptions that the buoyant U.S. economy would continue to grow rapidly during 1995 (albeit with some slowdown anticipated in response to increases in U.S. interest rates during 1994) while substantial margins of slack were present in both Japan and Germany, led the Surveillance Committee (by March 1995) to the view that concerted interest rate actions by the G-3 countries—upward adjustment in the United States and downward adjustments in Japan and Germany—would be desirable for purposes of addressing both internal and external imbalances.

69. The emerging consensus was reflected in confidential communications to the Board and the G-7 by the Managing Director, expressing concern with the recent sharp depreciation of the dollar against the deutsche mark and yen and arguing that there was room in each of the three largest industrial countries for at least modest adjustments of official interest rates to counteract undesirable exchange market pressures, without compromising the main objectives of monetary policies. Concerns also were expressed publicly about exchange rate movements in the context of welcoming the Bank of Japan's decision to cut its discount rate in April 1995.⁵⁸ In that statement, the Managing Director argued that "large and rapid" exchange rate changes posed a risk of higher inflation in the United States and weaker growth in Europe and Japan. He called for simultaneous and coordinated interest rate actions on the part of the G-3, reinforced by medium-term fiscal adjustment in the United States and Europe, and market opening measures in Japan. The May 1995 *World Economic Outlook* avoided a public judgment that exchange rates were misaligned and instead focused on the mix of concerns that had weighed on markets and called for coordinated policy actions, along the lines of the Interim Committee's Declaration on "Cooperation to Strengthen the Global Expansion" adopted at the Madrid meeting the previous fall. A common feature to all of the above statements was the focus on the need to reduce internal and external imbalances through

⁵⁶The RES S-I model had not yet been developed, and the norms that the staff relied upon at the time were based on a different framework.

⁵⁷While the CGER calculations at the time unambiguously pointed to an overvaluation of the yen on a multilateral basis, they did not indicate a corresponding undervaluation of the U.S. dollar. In the latter case, judgmental factors played a decisive role.

⁵⁸IMF News Brief 95/12, 4/14/95

improved fundamentals, which was not only aimed at moving exchange rates to a better international alignment, but was also justified on domestic grounds.

70. The view that exchange rates were out of line with fundamentals, but not the call for coordinated action, was echoed in the April 1995 Interim Committee communique, where “the Committee considered that recent exchange rate movements for some major currencies had gone farther than warranted by fundamentals and agreed that orderly reversal of these movements is desirable.”

71. In the event, while monetary policy was eased in Germany and Japan in response to weakening cyclical conditions, the case for higher interest rates in the United States was subsequently eroded by signs of a greater-than-expected slowdown in activity (partly reflecting spillovers from the economic crisis in Mexico), setting in motion a lowering of the federal funds rate, ultimately amounting to 75 basis points, from early July. Concerted intervention also contributed to a shift in market sentiment in favor of the dollar. With the benefit of hindsight, an increase in U.S. interest rates in the spring of 1995 would not have been helpful for the United States or the world economy. But the judgment that the major currencies were badly misaligned remains widely accepted among policymakers today.

72. The weakness of the U.S. dollar against the yen and the mark during the first half of 1995 was a major issue in the staff’s Article IV discussions.

- In Japan, the Article IV staff report⁵⁹ saw the yen as “clearly overvalued in terms of fundamentals,” a view reinforced by the Board at the time of the July 1995 consultation. Various measures of the appropriate trend value of the yen were presented by the staff, producing an average deviation of around 25 percent. Some reversal was expected. Intervention had been used to offset short-term pressures in markets, but would have relatively little effect in the longer term. The staff recommended an easing of monetary conditions, although it was recognized that there was limited room for further reductions in interest rates from already low levels.
- In the U.S. staff report,⁶⁰ staff noted that the U.S. dollar had depreciated beyond levels that could be justified by fundamentals. Staff agreed with the U.S. authorities that economic policies should not be aimed at any specific level of the dollar, but the weakness of the dollar reinforced the need for policies aimed at reducing U.S. reliance on foreign saving and achieving domestic price stability. In concluding the Article IV consultation in August,

⁵⁹SM/95/160, 6/30/95

⁶⁰SM/95/174, 7/17/95

Directors expressed a range of views on the source of the dollar's weakness against the other major currencies. While a greater degree of exchange rate stability was seen as desirable, Directors agreed that policies should not be aimed at a specific target for the dollar's exchange rate. These discussions took place at a time when the U.S. slowdown in the first half of 1995 was becoming apparent, and expectations were shifting toward the view that some additional monetary easing might be required to ensure growth at or above potential.

- In Germany,⁶¹ the staff report for the 1995 Article IV consultation noted that the recent appreciation of the deutsche mark "raised concerns about competitiveness, and questions as to whether policy action should be attempted to moderate or reverse it." In light of weak economic activity, the staff saw room for policy actions that boosted domestic demand. At the Board discussion in August, Directors agreed with the assessment of the authorities and the staff that the appreciation of the deutsche mark in the early part of 1995 had gone beyond what was justified by fundamentals, and welcomed recent concerted intervention by major central banks, which appeared to have helped in restoring a better pattern of exchange rates between the major currencies.

B. The Re-entry of the Lira into the ERM

73. The CGER methodology entered into management and staff assessments of the lira in the fall of 1995 and through most of 1996, when the lira's re-entry into the ERM was under discussion. Building on a discussion of lira undervaluation at the time of the March 1995 consultation with Italy, the level of the exchange rate and issues of policy credibility were at the center of discussions through the early part of 1996. CGER's analysis indicated that Italy had a large underlying current account surplus at prevailing exchange rates, significantly exceeding the current account balance consistent with medium-term fundamentals. However, it also was recognized by the staff and many members of the Board that the undervaluation of the lira evident at that time reflected market uncertainties about fiscal policies and expectations that inflation in Italy might well remain significantly above that in partner countries.⁶² An appreciation of the currency towards its estimated medium-run equilibrium value was thought unlikely as long as political uncertainties and fiscal problems remained unresolved. The staff took the view that further front-loaded fiscal measures would provide the key to reducing uncertainty and would be likely to contribute to an appreciation of the currency. But it warned against engineering such an appreciation by monetary policy. In these

⁶¹SM/95/183, 7/28/95

⁶²Consistent with this view, lira-denominated assets were trading at large interest premiums.

circumstances, Directors took the view in the spring of 1996 that re-entry of the lira into the ERM was not a viable option unless fiscal plans were first strengthened sufficiently to reduce interest rate premia on the lira and raise it toward the appropriate ERM parity.⁶³ In contrast, by the fourth quarter of 1996, with the lira having appreciated substantially in association with declining inflation and reduced interest rate premia, the staff's analysis—based on both international competitiveness indices and the CGER methodology—supported Italy's reentry into the ERM within a range that included the central parity that was eventually chosen for the lira.

C. The Constellation of Major Currencies in the Spring of 1997

74. While the assessment of G-3 exchange rates this past spring also found significant deviations from medium-run levels, a very different conclusion from the one in spring 1995 emerged with respect to the appropriateness of prevailing exchange rates. Analysis in the spring of 1997 supported the general conclusion that current levels of the yen, dollar and the pound had moved 10-20 percent beyond their medium-run equilibrium levels, and it was believed that these three currencies could consequently be subject to some reversal of the recent movements in their multilateral values over the medium term. Part of the estimated deviations from medium-run levels of the G-3 currencies was matched by interest rate differentials, suggesting that markets also expected some realignment over time. In that context, and in light of cyclical conditions, the prevailing configuration of exchange rates was seen as broadly appropriate. By comparison with the situation in April 1995, in the spring of 1997 the alignment of the yen was seen as alleviating the cyclical weakness of the Japanese economy, and the strong dollar also was not regarded as unhelpful from a cyclical perspective, given estimates that the U.S. economy was operating close to or above its potential output level.

75. These assessments were reflected in the subsequent Article IV discussions for Japan, the United States and Germany, although with less intensity than in 1995 given the absence of a need for an immediate policy adjustment.

- In the Japan staff report, staff noted that the yen had “returned to a range that appears broadly consistent with fundamentals.”⁶⁴ They noted that the depreciation of the yen from its peak in 1995 would likely cause the current

⁶³Italy — The Acting Chairman's Summing Up at the Conclusion of the 1995 Article IV Consultation; SUR/96/26, 3/28/96.

⁶⁴Japan — *Staff Report for the 1997 Article IV Consultation*, SM/97/176, 7/3/97, p.40. See also *The Acting Chairman's Summing Up at the Conclusion of the 1997 Article IV Consultation with Japan*, SUR/97/89, 8/4/97.

account to rise, but that reflected a desirable redistribution of demand pressures. Over the medium term, the yen was likely to appreciate, reflecting a continuation of past trends and the decline in the current account surplus as the population aged. These views were subsequently echoed by Directors during the Board discussion.

- In the United States, the Article IV staff report—reinforced by Directors in the summing up—stated that the recent appreciation of the U.S. dollar “mainly reflects relative cyclical positions and policy developments in the major countries, together with confidence inspired by the strong U.S. economy.”⁶⁵ Staff and Directors also noted that the dollar’s strength had helped to moderate aggregate demand in the United States and limit inflationary pressures, but that the high level of U.S. domestic demand and the appreciation of the dollar had contributed to a widening in the external current account deficit. The best means of addressing this latter problem was to improve national savings.
- In Germany, the Article IV staff report noted the Bundesbank’s discomfort with the “excessively rapid movement” of the currency against the dollar, but the staff saw the real effective depreciation of the deutsche mark as helpful from a cyclical perspective and also noted that relative unit labor costs remained high.⁶⁶ Greater flexibility in labor markets was the key to enhancing the vitality of the German economy. Directors did not specifically address the appropriateness of the exchange rate, but did see the deutsche mark’s depreciation as supportive of recovery.

D. Policy Implications

76. These experiences illustrate that deviations of exchange rates from their medium-run equilibrium levels do not always call for the same type of policy response. In each of the three cases examined, the staff’s quantitative assessment of real equilibrium exchange rates provided a basis for Fund and Fund staff assessments that the real values of some currencies differed substantially from their medium-run levels. Yet in each of the cases, a different policy prescription resulted, and CGER’s assessment was only one input among other factors in

⁶⁵*United States — Staff Report for the 1997 Article IV Consultation*, SM/97/177, 7/7/97, p.30. See also *The Acting Chairman’s Summing Up at the Conclusion of the 1997 Article IV Consultation with the United States*, SUR/97/87, 8/1/97.

⁶⁶*Germany — Staff Report for the 1997 Article IV Consultation*, SM/97/204, 8/4/97, p.33. See also *The Acting Chairman’s Summing Up at the Conclusion of the 1997 Article IV Consultation with Germany*, SUR/97/94 8/27/97.

forming an assessment of appropriate exchange rate levels. In the spring of 1995, the Fund's call for concerted interest rate adjustments to correct perceived misalignment among the G-3 currencies came at a time of growing consensus that a realignment of exchange rates among the G-3 was desirable. Subsequently, the monetary policy stance in both Germany and Japan was gradually eased, in a context where domestic factors so required, supporting the required correction in exchange rate levels. In the case of Italy through early 1996, the focus was on fiscal policy to improve economic fundamentals in advance of ERM reentry, while in the spring of 1997 in the view of the staff the pattern of exchange rates did not call for particular measures against the background of large divergences in the cyclical positions of the major industrial countries.

VI. CONCLUDING REMARKS AND ISSUES FOR DISCUSSION

77. Following the Mexican crisis in 1994/95 and the subsequent in-depth examination of surveillance, there has been renewed emphasis on the core responsibility of the Fund to conduct firm oversight over members' exchange rate policies. Discussions with member authorities, reflected in staff reports, focused more on exchange rate issues, resulting, on occasion, in more candid and pointed recommendations. When key exchange rates were considered seriously misaligned, as they were in the first half of 1995, the Fund has communicated its views to member authorities. At the same time, the Fund has been careful to avoid premature public judgments in this sensitive area.

78. At the level of the staff, the CGER framework has provided the analytical tool kit to develop its views on exchange rate constellations among the major currencies. The framework has provided an increasingly important input to surveillance, as one of a range of indicators on which the staff has based its judgment that an exchange rate is or is not misaligned. The framework does not deliver, and is not intended to deliver, precise estimates of exchange rate misalignments. By and large, however, it seems to have provided the right signals in recent cases of major movements in key exchange rates, and has helped the Fund to present a critical and independent assessment of exchange rate alignments in the G-7 context in a manner consistent with its mandate and at an early stage.

79. In illustrating CGER's methodology for assessing current account positions and exchange rates, this paper has emphasized the following points:

- Exchange rate assessments are an integral part of the Fund's surveillance responsibilities; and although such assessments necessarily rely on information and judgments that are not easily integrated into any formal analytical framework, a systematic and transparent framework can impose an important degree of rigor and multilateral consistency.

- While the analytic framework employed in CGER's exchange rate assessments has been refined and extended in several significant ways during recent years, it basically reflects the macroeconomic balance approach that the Fund staff has been relying upon for at least the past three decades.
- The primary motivation for CGER's exchange rate assessment exercises is to look for cases of badly misaligned exchange rates ("wrong rates"), not to prescribe exchange rate targets or target zones. Estimates of "equilibrium" exchange rates cannot be placed within narrow confidence bands.
- As a framework for helping to identify cases of badly misaligned exchange rates, the methodology is oriented toward assessing the extent to which prevailing exchange rates are consistent with medium-run fundamentals. Such assessments provide inputs for the Surveillance Committee to use as a starting point in judging the appropriateness of prevailing exchange rates in the context of a broader range of considerations, including the cyclical positions of national economies. The focus of CGER's work so far has been on exchange rates among the systematically-important major countries.
- The framework can be divided into several components. The first step focuses both on the WEO projections and on calculations based on the RES trade-equation model as two separate estimates of what underlying current account positions would be if all countries moved to potential output and if real exchange rates remained constant at prevailing market levels. The second step looks at the determinants of saving and investment, using a different type of model, and derives estimates of "equilibrium" or "normal" current account positions consistent with the underlying behavior of saving and investment in the medium run. In deriving these "norms," the detailed knowledge of the Fund's country experts is integrated with estimates based on the RES S-I model. The third step in the process calculates the extent to which prevailing real exchange rates differ from the medium-run equilibrium levels that would bring the underlying current account positions into line with the saving-investment norms. The fourth step involves judgmental assessments of whether the estimates of exchange rates consistent with medium-run fundamentals suggest that any currencies are badly misaligned.
- Whether anything should be done when CGER concludes that prevailing exchange rates differ substantially from their medium-run equilibrium levels is left as an entirely open question—to be addressed on a case-by-case basis, and in the context of considering the extent to which monetary and fiscal policies are appropriate from a broader perspective. As experience during the past two years has indicated, the policy responses that the Surveillance Committee has recommended when exchange rates have appeared to differ substantially from medium-run equilibrium levels have indeed been different from case to case.

80. Directors may wish to comment on the following issues for discussion:

1. Do Executive Directors agree that in its role as the central institution of the international monetary system, the Fund should seek continuously to strengthen its analysis of exchange market developments? Do Directors share the staff's view that it is difficult to be very precise in identifying "equilibrium values" for exchange rates, and that, for this reason, a key objective should be to try to identify circumstances in which exchange rates have become substantially inconsistent with medium-run fundamentals?
2. Staff work in the context of the CGER has focused mainly on the exchange rates of the major industrial countries. Do Directors agree with the focus on countries whose currencies are systemically most important? Looking ahead, could the approach usefully be applied to a broader set of Fund members?
3. CGER's assessments depend importantly on the conceptual models and empirical estimates that are used to quantify the influence of exchange rates on current account positions and to calculate medium-run equilibrium levels for saving-investment balances. Do Directors share the staff's view that these are key issues on which continuing analytic work is warranted?
4. Significant deviations of prevailing exchange rates from their medium-run equilibrium levels can reflect several different types of situations and should not always be judged as serious misalignments. Do Directors agree that deliberations about appropriate policy responses in such situations need to be addressed on a case-by-case basis, taking account of a variety of factors, including the extent to which prevailing policies are appropriate from a broader perspective? Do Directors broadly share the staff's conclusions in the episodes described in the paper?
5. Reflecting the conclusions of the 1995 biennial surveillance review, the CGER analysis has been a largely internal staff exercise to date, representing one input among others in the staff's surveillance work on members' exchange rate policies. On occasion, this work has informed the staff's discussions with members in the context of Article IV consultations and has been reflected in the staff reports. In a few instances, notably in the spring of 1995, the Fund has made public statements regarding the constellation of major exchange rates. Do Directors consider that the balance between internal analysis and public statements about major-currency exchange rates has been appropriate?

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